

I have seen the single specimen in the Museum of the Jardin des Plantes at Paris, upon which the Prince Charles Bonaparte established this new species. I must confess I should like to see more examples of it; as it appears to me to be very possibly nothing more than the small variety of the preceding type-species with an accidental white bar on the wing. But I did not make a very accurate examination of it, and the Prince Charles Bonaparte has had a much better opportunity of deciding whether it is a good species than I have. To his authority I defer.

XLVI.—*On the Anatomy of the Giraffe* (*Camelopardalis giraffa*, Linn.). By T. SPENCER COBBOLD, M.D., Conservator of the Anatomical Museum, University of Edinburgh*.

I HAVE already communicated to the Physiological Society of this city a few of the results obtained by a careful dissection and evisceration of the carcase of a Giraffe. Subsequent examination of the parts then removed has furnished me with additional details, to which, in connection with the above, I now beg to direct your attention.

The animal recently formed an attractive feature in the collection well known as Wombwell's Travelling Menagerie. From one of the keepers I ascertained that it had been in this country only seven months; in height it was about 14 feet, and was believed to be rather more than two years old. Until a very short while before death no symptoms of disease had been detected, and the creature was regarded as an exceedingly healthy specimen. I understood that no fewer than six individuals of this interesting genus (which comprises but this one species) had been purchased at different times for the collection, but each of them, as in the present instance, expired before it had been eight months in Wombwell's possession. This cannot surprise us, as we well know that in spite of all the painstaking and expense incurred in endeavouring to keep them alive, no such effort can prove successful, unless a roomy apartment and numerous other desiderata be supplied, such as are so advantageously afforded in the case of those kept in the London Zoological Society's Gardens, Regent's Park.

In the Giraffe under consideration, the first unfavourable indications appeared in the fore-limbs; these symptoms were attributed to the severity of the cold which prevailed here in the winter season. The usual remedies were applied, but the extremities gradually gave way until complete paralysis supervened, and the animal sank about eight days after the first traces of internal disturbance.

* Read to the Royal Physical Society of Edinburgh, April 5th, 1854.

The carcase was purchased for the Museum of Natural History by Prof. Traill, to whom our thanks are due for handing over to the Anatomical Museum of the University, the viscera and soft parts which remained after the skin and extremities had been removed. In prosecuting the dissection, Mr. John Lowe kindly rendered assistance, when the following facts were noted.

The rumen, reticulum, psalterium, and stomach occupied the anterior two-thirds of the abdominal cavity, the intestines being situated further back and suspended, as it were, from the lumbosacral region of the spine. The paunch was very greatly distended with food, to which the general enlargement of the abdomen, observable before the body was opened, seemed principally due. I allude to this circumstance in particular, because little or no fluid had accumulated in the peritoneal cavity, and the omenta (which in all the three previously recorded dissections of the Giraffe made in this country were found loaded with fat) in the present instance exhibited scarcely the slightest trace of fatty deposit. In the colon, cæcum and rectum, the fæces had assumed their characteristic pellet-like form, and the alimentary mucous surface appeared healthy throughout.

The spleen, though of the normal size, was very soft and readily tore up on being handled, the pulp of an almost absolutely black colour separating and running out like thin fluid, leaving the matrix (consisting of the trabeculæ, arterial and venous trunks) quite bare in places. This rapid disintegration was not considered sufficiently explained by the circumstance of the animal having been dead four days.

The pancreas was healthy and in its usual situation.

The liver, placed far forward in contact with the diaphragm and in front of the stomach on the right side of the body, is an exceedingly simple organ. In form, it is elongated, compressed and slightly fissured, so as to indicate a bilobular tendency: on the under surface there is an elevation corresponding to the lobus Spigelii, the outer border of which is particularly prominent. The entire gland weighed 5 pounds and 6 ounces, and measured in the longitudinal diameter 16 inches, 9 inches transversely, and but $2\frac{1}{2}$ in thickness. To the naked eye and to the touch, it appeared healthy, but here and there were detected small hard points, which on further examination were found to be cysts containing in their interior *cysticerci*, or entozoa in the larva state. It was not until nine days had elapsed since the death of the Giraffe, that I detected also in the bile-ducts of the liver, several individuals of the genus *Fasciola**, and by means of a

* *Fasciola*, Linnæus, Blanchard, &c. *Distoma*, Rudolphi, Bremser, &c. The term *Distoma* is unfortunate, as leading to the idea of two mouths; the genera *Fasciola* and *Distoma* have only one true oral aperture, as in

syringe, I subsequently washed out of the ducts nearly forty specimens of this entozoon, many of which were thus fortunately preserved entire, and having placed them in strong spirit, I have succeeded in injecting their so-called vascular and digestive systems.

No gall-bladder could be discovered.

On removing the abdominal viscera *en masse*, the connecting fibro-cellular tissue surrounding the left kidney was found infiltrated, soft and yielding; the renal organ in a semi-putrid condition, with its substance broken up, pultaceous and intensely fœtid; the capsule enclosing the right kidney was more firm, but on being opened the contained gland presented the same far advanced state of decomposition. The bladder was small, contracted and empty.

The contents of the thorax were next examined. We found the lungs collapsed, the one on the left side more completely so; both were very soft, of a dark brown colour externally, and appeared small in proportion to the calibre of the thoracic cavity. The left lung was much congested and gangrenous in places; softening and partial disintegration of some of the larger bronchi had also commenced. The right lung was less congested and more healthy throughout.

In reference to the heart, no particular observations were made at the time of its removal. I have compared it with that of the Camel, in which ruminant the relative size of the auricles and ventricles is less disproportionate; the organ is also very much larger than that of the Giraffe. The present example weighed 4 pounds, measured 8 inches from base to apex, and 6 inches in breadth through its greatest transverse diameter.

We have thus far considered the general characters and morbid appearances presented by those viscera in which the vital functions are principally performed. It is singular that so great an amount of internal disease should have been going on while the animal appeared in a healthy state. When the keepers were informed of these results, much surprise was expressed by one of them, more especially at the statement made respecting the almost entire absence of fat. In dissections of the Giraffe, the prevalence of this element has hitherto attracted particular attention, so that in this instance its non-occurrence affords strong presumptive evidence, that the functions of nutrition and secretion had for some time been impaired.

Monostoma; they are distinguished from the latter genus by the presence of two ventral suckers (which were originally considered *stomata*), and from each other by the digestive organs, which in *Fasciola* are ramified or dendritic. See Blanchard's papers, Ann. des Sciences Nat. 1847, Zool. p. 278 *et seq.*

Other lesions than those already enumerated were detected. The paralysis finds its explanation in ramollissement of the spinal cord, softening of that portion of it corresponding to the last cervical and first dorsal vertebræ having taken place; elsewhere it was firm in texture and closely enveloped by the dura mater. The brain was healthy, but a desire to preserve the cranium entire prevented our examining it very minutely. Its removal piecemeal has enabled me, however, to retain a tolerably accurate cast of its size and form, and illustrates the small bulk of the cerebellum as compared with the cerebrum. The following are its dimensions:—extreme length 6 inches; breadth 4 inches; longitudinal diameter of the hemispheres $4\frac{1}{2}$ inches. The cranial cavity when emptied of its contents was found capable of holding 21 ounces of water. The cerebrum and cerebellum weighed 19 ounces.

Differences in the development of the cranium are said to be found in giraffes inhabiting respectively the more northern or southern regions of Africa. These distinctive peculiarities have more especial relation to the position and approximation of the horns. In the variety under consideration, which was imported from the coast of Abyssinia (whence they are usually obtained), I have noted the following particulars in reference to the bones of the head:—

Length of cranium; incisive symphysis to horn tips	20	inches.
Do. do. incisive angle to occipital crest ...	19	„
Incisive angle to tip of central eminence	$11\frac{1}{2}$	„
Extreme cranial breadth	$8\frac{3}{4}$	„
Length of horns	$5\frac{1}{2}$	„
Distance between horn tips	4	„
Depth of orbit	3	„
Greatest diameter of orbital ring	$2\frac{1}{2}$	„
Breadth of occipital condyles	$3\frac{7}{8}$	„
Depth of each condyle	$2\frac{1}{2}$	„
Distance between articular surfaces of condyles, only ...	4	lines.
Length of hard palate	$10\frac{1}{2}$	inches.
Extreme width of ditto	3	„
Length of lower jaw	$15\frac{1}{2}$	„
Depth of rami of ditto	6	„
Breadth between condyles of ditto	$2\frac{1}{2}$	„
Do. between rami	$4\frac{1}{2}$	„
Do. opposite fourth molares	$1\frac{1}{2}$	„

Several of the grinding teeth are much decayed, and illustrate further the impoverished state of the nutritive functions. The dental formula stands thus:—

$$\text{Incisors } \frac{0-0}{4-4}; \text{ molars } \frac{6-6}{6-6}; = 32.$$

The four posterior grinders had not penetrated the gum. The two outer incisors have divided crowns.

I have but little to say concerning the *tongue*, which has been most carefully anatomised by Professor Owen. We have injected and dissected this organ, and, as Prof. Owen has shown, no vascular reservoirs, or any trace of erectile tissue is to be found, whereby (as Sir Everard Home supposed) the prehensile movements of the organ might be regulated; on the contrary, its exalted functions are due to muscular action, the motor nerves supplying it being very large and tortuous when the tongue is not stretched out. Imbedded in the cellular aponeurosis surrounding the styloglossi and lingualis muscles, were found three small semitransparent cysts, containing entozoa, and resembling somewhat those *cysticerci* which we spoke of when describing the liver. A microscopic examination of their contents throws much doubt upon their identity, but upon these differences we shall not now enter. The tongue measures in length 16 inches; in breadth (3 in. from tip) $2\frac{1}{4}$, and at the molar region 3 inches; the anterior darker portion (or that continually exposed to the air) measures rather more than 7 inches.

In conclusion it may be noted, that at the anterior part of the mouth, beneath the tongue and immediately behind the incisors, there are two small membranous folds, at the base of each of which the orifices of two salivary ducts are visible. The palatal ridges and buccal papillæ are largely developed. The passages to the tonsils readily admit the tip of the little finger. The rudimentary uvula consists of three small and closely approximated papillæ. The trachea measures 4 feet in length, and if slightly stretched will be increased 7 inches. The elastic ligamentum nuchæ, which in the living state extended about 5 feet 6 inches, after its removal measured only 3 feet 7 inches. Examined microscopically Professor Quekett tells us that the fibres of this latter structure exhibit a transversely striated appearance, which is due to the presence of certain (scalariform) openings, which do not extend across the entire diameter of the fibres. Several gentlemen have availed themselves of the opportunity here afforded; we have searched for these characteristic markings according to indications given by Prof. Quekett, but it does not appear that any of us have succeeded in detecting the openings in question.

XLVII.—On the Growth of Sea-Weeds.

By P. H. GOSSE, A.L.S.

THE Rhodosperms, or Red Sea-weeds, must be the test of success in any attempts to cultivate the marine *Algæ*, and this for several reasons; such as their superior beauty; the great number